SWAN LAKE NWR
NARRATIVE REPORT - 1967

Narrative Report
Swan Lake National Wildlife Refuge
January - December, 1967

## PERMANENT PERSONNEL

| | |
|---|---|
| Robert H. Timmerman ..... | Refuge Manager |
| Lawrence G. Kline (EOD 8/14/67) ..... | Asst. Refuge Manager |
| Bennie M. Hull ..... | Biological Technician |
| Benny N. Howerton ..... | Operator General |
| Marvin F. Lentz ..... | Refuge Clerk |

## TEMPORARY EMPLOYEES

| | |
|---|---|
| Floyd A. Holland ..... | Laborer, Farm |
| Roy T. Warren ..... | Laborer, Farm |
| Ervin Windsor ..... | Laborer, Farm |

# C O N T E N T S

# I. GENERAL

## A. Weather Conditions

| | Precipitation | | | Max. | Min. |
|---|---|---|---|---|---|
| | Month | Normal | Snowfall | Temp. | Temp. |
| January | 2.11 | 1.64 | 13.0 | 67 | -2 |
| February | .77 | 1.79 | 4.0 | 64 | 0 |
| March | 2.32 | 2.57 | | 82 | 7 |
| April | 7.37 | 3.72 | | 82 | 27 |
| May | 6.95 | 4.52 | | 91 | 34 |
| June | 9.25 | 4.87 | | 87 | 47 |
| July | 1.99 | 3.92 | | 96 | 52 |
| August | .64 | 3.67 | | 94 | 43 |
| September | 5.18 | 4.88 | | 86 | 32 |
| October | 8.99 | 2.72 | | 86 | 26 |
| November | .72 | 2.32 | | 64 | 22 |
| December | 1.86 | 1.65 | | 61 | -3 |
| Annual Totals | 48.15 | 38.27 | 17.0 | Extremes 96 | -3 |

**The above figures were reported from the official weather station at the Fountain Grove Wildlife Area, located about eight miles northwest of refuge headquarters.**

A. Weather Conditions

We received almost ten inches more than normal precipitation during the year. This wouldn't have been too bad if it had been equally distributed. However, this was not the case. We received 23.57 inches of rain during April, May and June. This deluge was followed by a sixty day period with no significant precipitation.

B. Habitat Conditions

1. Water

This was one thing we had plenty of. During June we experienced the greatest flood on record for this area. On June 14 the Grand River crest was 33.1' at Chillicothe compared to the still talked about crest of 33.8' in 1947. The flood crest of 37.75' was reached on June 16 at Sumner. We have no official reading at Sumner for the 1947 flood but a high water mark placed on the Yellow Creek bridge at that time was several inches under water.

The water was more than two feet deep over portions of the headquarters entrance levee on June 16. The manager's family, along with the five other families on "Hog Ridge", was living on an island. We had taken two vehicles to Sumner, so we had transportation on the other side of the water. The only mode of travel across Swan Lake was a square-stern canoe with a 2½ horsepower motor.

The "Garden of Eden" levee below the refuge broke allowing the flood area to expand and the water level dropped quite rapidly. By the evening of June 17 we had the entrance road open to necessary traffic.

The summer drawdown of Swan and South Lakes began on schedule May 15, but due to the flood summer elevation on Swan Lake was not reached until early August. The Silver Lake water valves were never completely closed except for brief periods throughout the summer.

2. Food and Cover

The following table compares food production during the past thirteen years.

## Foods Available For Waterfowl 1955-1967

| Year | Bushels of Grain * | Acres of Wheat | Acres of Legumes | Acres of ** Moist Soil Foods |
|---|---|---|---|---|
| 1955 | 11,450 | 718 | - | 400 |
| 1956 | 27,330 | 712 | - | 400 |
| 1957 | 29,800 | 967 | - | 400 |
| 1958 | 4,920 | 1,276 | 15 | 400 |
| 1959 | 34,750 | 979 | 212 | 2,000 |
| 1960 | 16,000 | 1,250 | 204 | 2,285 |
| 1961 | 21,180 | 223 | 638 | 2,200 |
| 1962 | 26,280 | 687 | 487 | 2,200 |
| 1963 | 52,600 | 667 | 525 | 2,200 |
| 1964 | 29,240 | 775 | 427 | 2,200 |
| 1965 | 86,300 | 660 | 250 | 2,200 |
| 1966 | 69,000 | 1,125 | 383 | 2,200 |
| 1967 | 35,000 | 1,150 | - | 2,200 |

* This includes corn, milo and rice.
** Includes mainly wild millet, chufa, tame millet, and smartweed.

The acreage figures in the above table for wheat, legumes, and moist soil plant foods can be confusing and do not present a true indication of available foods. In 1967 the wheat was planted early under very dry conditions. Most of it did not germinate until it rained about two weeks later. The wheat was short when the geese arrived and was quickly consumed. Although the total acreage of moist soil plant foods remained the same, seed production was poor as a result of the flood.

This was not our year for farming at Swan Lake. We did succeed in getting our legumes planted under almost ideal conditions during March. April was wet and we were not able to work a day in the field during the entire month. We finally planted most of the corn during May.

Then the flood came and wiped out everything except 150 acres of corn on the high ground near headquarters. All the rest of the corn and the legumes including strawberry clover, were lost. Even the 150 acres of corn that did remain was threatened to be lost to giant foxtail as it was too wet to get on the ground to spray or cultivate it. We finally managed to get it sprayed with atrazine from the air.

We were not able to start replanting corn until July 3. We knew it would be late, wo we planted the shortest season corn and milo seed available. The last of the milo was planted July 19 which proved to be too late. An early killing frost occured on September 20. Some food was produced, but all the late corn was soft and milo seed production was poor.

In addition to fighting the weather, we ended up fighting insects.

What was termed by the County Extension Agent as the worst army worm infestation he had ever seen was discovered in this late planted corn along with extensive damage from subterranean cutworms. About 80% of the army worms were killed by an application of one pound of Sevin in ten gallons of water per acre put on as a band spray. Cultivation cut down somewhat on cutworm activity. Some fields were also damaged by corn rootworms, but we could do nothing to control this. The lateness of the planting was blamed for this insect damage and we do not anticipate extensive damage next year if the corn can be planted at the normal time.

As mentioned previously, the wheat did not make good growth and was soon consumed when the geese arrived. There were no legumes for them to move to next so they went after the corn. All of the late corn had lodged badly and was readily available. The geese seemed to relish this soft corn and cleaned it up in record time.

The four farmer permittees on the refuge this year managed to harvest only about 400 bushel of corn. The geese harvested the remainder. There is practically no food on the refuge at the end of the reporting period except for some regrowth of wheat and rye in the more lightly used areas.

## II WILDLIFE

### A. Migratory Birds

#### Ducks

We had the usual small fluctuating flock of wintering mallards. They did not exceed 4,000 birds until late in February when spring migrants began arriving. The mallards peaked at 60,000 during the third week of March. The peak of total ducks, which numbered 80,150, was also reached during this week. Nearly all of the migrants except blue-winged teal and shovelers had departed by mid-April.

Our summer population was estimated at 400 wood ducks plus a few mallards and blue-winged teal. A few wood duck broods were observed in the borrow pits along the levee roads.

Both species of teal and a few pintails began arriving during the third week of August. Green-winged teal were unusually abundant relative to blue-wings during late August and September. Numbers of green-wings equaled or exceeded blue-wings from the first of September throughout the remainder of the fall. Due to the poor production of moist soil plants we held no large concentrations of either species during the early migration. Blue-wings peaked at 900 and green-wings at 1,000 during the second week of September. On September 1 a shot with one 30' x 60' net resulted in a catch of 312 green-winged teal. These were predominately adult males. Both species of teal declined in numbers during the last half of September.

A second and larger migration of green-wings took place during the second week of October when they peaked at about 10,000. Pintails also peaked at 10,000 and remained close to this figure for about a month.

Mallards numbered 75,000 by the third week of October. They peaked at 90,000 around November 1.

There were more divers observed on the refuge this fall than usual. We had a peak of 8,000 scaup and 2,000 ringnecks. These birds stayed for about a week, and then declined rapidly. We also observed small numbers of most other diver species.

Total duck use for the year was 7,805,455 days compared to 9,401,420 in 1966. This decrease can be attributed to the fact that the ducks moved through more rapidly in the spring, and that we had insufficient food to hold them for long in the fall.

Geese

Our wintering population of Canada geese fluctuated between 20,000 and 85,000 birds. During very cold weather many of the birds would move to the Dalton Cut-Off and the Missouri River. Then when the weather moderated most of them would return to the refuge.

There were around 4,000 blue and snow geese wintering in the zone. They reacted to the weather in the same general manner as outlined above for Canada geese. Blue and snow geese peaked at 40,000 during spring migration.

Between one and two hundred Canada geese spent the summer on the refuge. No nesting attempts or broods were observed.

Fall migrant Canada geese began arriving on September 21. An aerial count on the 27th showed 28,500 on the refuge. Canada geese peaked at 130,000 and blue and snow geese at 30,000 during the last week of October.

A few white-fronted geese were observed during spring and fall migrations.

Checks made at the Swan Lake Public Hunting Area indicated that our Canada goose flock was running about 5.6% small Canadas during the first five days of the hunting season (Oct. 20 - 24).

The table on the next page compares waterfowl use for the months of September through December during the last 13 years.

Number of Days Use

| Year | Canada Geese | Other Geese | Ducks | Coots | Totals |
|---|---|---|---|---|---|
| 1955 | 4,692,100 | 170,100 | 7,691,500 | 90,800 | 12,644,500 |
| 1956 | 3,390,300 | 354,900 | 4,097,700 | 52,700 | 7,895,600 |
| 1957 | 2,449,000 | 36,300 | 4,289,300 | 32,450 | 6,807,050 |
| 1958 | 2,505,700 | 198,600 | 2,131,400 | 14,500 | 4,850,100 |
| 1959 | 3,364,825 | 468,489 | 4,363,621 | 373,800 | 8,570,735 |
| 1960 | 5,738,300 | 358,610 | 3,400,925 | 317,435 | 9,815,825 |
| 1961 | 4,546,580 | 428,953 | 4,393,500 | 85,750 | 9,454,783 |
| 1962 | 7,113,600 | 657,300 | 1,344,360 | 107,100 | 9,222,360 |
| 1963 | 8,831,375 | 969,920 | 4,677,750 | 230,300 | 14,709,345 |
| 1964 | 7,980,700 | 687,050 | 4,931,220 | 175,350 | 13,774,320 |
| 1965 | 9,122,400 | 831,180 | 5,845,560 | 321,440 | 16,120,580 |
| 1966 | 11,272,800 | 1,684,340 | 6,979,630 | 398,650 | 20,335,420 |
| 1967 | 9,774,800 | 1,578,570 | 5,792,395 | 444,500 | 17,590,265 |

Our population figures are based on the weekly aerial counts made by Dick Vaught, Waterfowl Biologist with the Missouri Department of Conservation.

See pages 7 and 8 for comparative zone counts on Canada Geese.

Waterbirds

White pelicans were first seen on March 29 when 30 were counted on the refuge. Fall migrants were first observed on August 21. They peaked at 1,300 on September 27. This was an increase over the peak of 700 for the fall of 1966, but was somewhat below the average for the past few years.

Five cattle egrets were seen about eight miles north of the refuge on April 11, and one was observed along the east boundary on May 2.

Only one D.C. Cormorant was seen this year. This bird was observed several times in early November on Silver Lake.

Ten black-crowned night herons were seen along the south pool levee on September 21.

Two Great Blue Herons are wintering near the South Lake Control structure. There is little open water available when the structure is closed, but they seem to be finding enough food to sustain them.

Shorebirds, Gulls, and Terns

Dowitchers were quite common on the Swan Lake mudflats during late August and early September. American Avocets were again observed, both in the spring and in the fall. Both of these species should be added to the refuge bird list on the next revision.

## SWAN LAKE COMPARATIVE POPULATION COUNTS

### CANADA GEESE

| Date | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|---|---|
| Sept. | 150 | 8,000 | 1,800 | 50,025 | 32,050 | 35,065 | 29,450 |
| Oct. | 24,750 | 13,325 | 33,725 | 85,150 | 57,650 | 76,425 | 50,245 |
| | 48,275 | 17,628 | 72,895 | 99,050 | 90,350 | 97,525 | 74,125 |
| | 73,600* | 74,300 | 111,800 | 121,450* | 106,650 | 102,775 | 105,500 |
| | 70,955 | 84,000 | 130,225* | 115,200 | | 124,400 | |
| | 70,300 | 93,000 | 115,300 | | | 138,000* | 122,200 |
| Nov. | 71,600 | 107,950 | 122,000 | 119,000 | 89,980 | 137,050 | 118,965 |
| | 62,465 | 95,000 | 101,650 | 76,000 | 119,350* | 126,900 | 127,265* |
| | | 118,200* | 98,700 | 88,000 | 79,750 | 104,350 | 108,600 |
| Dec. | 54,900 | 95,200 | 124,150 | 45,530 | 82,250 | | 106,605 |
| | 39,500 | 102,500 | 84,650 | 45,230 | 110,250 | | |
| | 38,550 | 60,900 | 56,500 | 54,065 | 104,650 | 123,160 | |
| | | 28,000 Mo. River | | | 86,555 | | |

* Peak Populations

## SWAN LAKE COMPARATIVE POPULATION COUNTS

### CANADA GEESE

| Date | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 |
|---|---|---|---|---|---|---|
| Sept. | 2,500 | 2,500 | 107 | 620 | 100 | 230 |
| Oct. | 55,000 | 4,600 | 3,675 | 41,000 | 12,650 | 50,500 |
| | 96,000 | 54,850 | 21,500 | 44,000 | 46,350 | 73,500 |
| | 133,500* | 35,180 | 36,500 | 48,000 | 46,130 | 86,850* |
| | 96,000 | 35,000 | no count | 54,000* | 52,000 | 81,000 |
| Nov. | 90,000 | 55,000* | 42,000 | 41,000 | 57,000* | 55,500 |
| | no count | 55,000 | 34,000 | 31,700 | 53,555 | 50,000 |
| | 57,000 | 41,000 | 22,000 | 19,365 | 33,905 | 51,530 |
| | 49,000 | 35,000 | 20,000 | 19,395 | 37,055 | 42,500 |
| Dec. | 21,000 | 36,000 | 23,000 | 14,000 | 34,620 | no count |
| | 15,000 | 31,745 | 18,000 | 20,000 | no count | 29,133 |
| | 12,000 | 12,000 | 18,000 | 20,000 | no count | no count |

* Peak Populations

All of the common shorebirds were numerous during late summer.

A few ring-billed gulls, Caspian terns, and black terns were observed during migration.

Doves

Doves were plentiful on the refuge in late August, but most of them departed early in September.

B. Upland Game

The heavy spring rains and the June flood undoubtedly disrupted bob-white nesting in the bottomlands. However, fall populations appeared to be about normal.

Pheasants are occasionally seen to the north of the refuge. However, it appears unlikely that this area will ever support a huntable population of these birds.

No prairie chickens have been observed in this area in recent years. However we are still maintaining some grassland habitat on the refuge which should be suitable as a release site for this species.

C. Big Game Animals

The June flood drove most of the deer from the refuge for a short period, but had no apparent effect on reproduction. The population that uses the refuge appears to continue to increase slowly. Road kills are becoming more of a hazard on the public road which borders the refuge on the north and east.

The legal harvest was down sharply from 1966 in Chariton County. This was not because of a lack of deer, but was due to a combination of other factors. The State has been alternating any deer and bucks only seasons in most northern counties for several years. The 1967 season was for bucks only. The wet fall delayed harvest this year, and the deer were feeding and bedding in standing corn. Also, a flood which occurred in late October and early November changed the movement and feeding patterns of the deer just prior to the opening of the season. It also made many of the best bottomland hunting areas nearly inaccessible. We had a split season this year running from November 18 to 22, and reopening during the first three days of December.

Larry Kline was the only member of the refuge staff lucky enough to kill a buck. The buck's antlers have been officially measured, and will make the Boone and Crockett Record Book.

During late December and early January a large herd of deer could be observed every evening feeding in an unharvested soybean field adjacent to the northeast corner of the refuge. This herd frequently

numbered in excess of 70 head.

D. Fur Animals, Predators, Rodents and other Mammals

Allen Dysart of Sumner was again allowed to trap on the refuge strictly as a raccoon control measure. He was allowed to keep all of his catch, but was instructed to trap specifically for raccoon, insofar as possible. His total catch for the period 12/1/67 to 1/15/68 was 204 raccoons, 35 opossums, 2 mink, 8 muskrats, 1 striped skunk, 1 badger, and 1 coyote. We were very well satisfied with his results and his attitude. We feel this trapping program will have a significant effect on the raccoon population, and should enhance wood duck nesting and reduce crop damage on the refuge.

Beaver were not a problem this year, therefore we authorized no removals. There are a number of active colonies on the refuge.

Red fox and coyotes are not plentiful on the refuge. However, coyotes seem to be increasing somewhat judging from tracks and actual sightings. A red fox was seen crossing the road along our north boundary on September 26, which appeared to be heavily infested with sarcoptic mange.

Muskrats are relatively scarce on the refuge because of the widely fluctuating water levels.

No important changes were noted in our populations of rabbits, squirrels, and other small mammals.

E. Hawks, Eagles, Owls, and Crows

We had an estimated 60 eagles on the refuge during November. Forty-four were counted while driving through the refuge on November 23. Our mid-winter inventory count was 16 adult and 24 immature bald eagles, 2 immature golden eagles, and 2 unknowns. This inventory was run on January 9, 1968.

We only received one crippled eagle this fall. This was an adult golden eagle brought here by GMA Hague on November 16. It fed on a freshly caught carp in the goose pen, but it died on the 18th. The eagle was later fluoroscoped, and found to be carrying several lead shot.

Red-tailed hawks were very abundant on the refuge during the entire year. No unusual species of hawks were observed.

A long-eared owl was seen on November 22 near the White Barn. This species is not on the refuge bird list.

No large concentrations of crows were observed on the refuge this year.

F. Other Birds

Leconte's sparrows were numerous in this area during late October. They are not on the refuge bird list.

Two pileated woodpeckers were seen on the refuge on November 23. This species is on the bird list, but is not often seen on the refuge.

G. Fish

The refuge was open to fishing from April 1 through September 10. The early season channel catfishing was not as good as it has been. Some nice strings of catfish were taken, but very few limits were filled. However, fishing throughout the remainder of the season was far better than normal. Higher than normal rainfall provided more water to be passed through the refuge. A large percentage of the fish were caught in running water near control structures. During several periods crappie fishing was excellent especially below the south Silver Lake structure. Several large-mouth bass were also taken at this location. These bass all appeared to be in the same age class and were probably fish stocked in Silver Lake during 1964. To our knowledge, no one has caught a red-eared sunfish also stocked in 1964.

When the north Silver Lake water valve was closed following the flood, the distribution basin was full of fish including thousands of channel catfish. We didn't have time to salvage these fish so we notified Agent Supervisor Wallace. Several State Agents and a group of fishermen from Brookfield salvaged the catfish for stocking in the old Brookfield reservoir.

No seining season for removal of rough fish was held this year. The only time this seining season is very successful is when we have the lakes drawn down and almost all the water areas are the borrow pits along the levees. The seining season was set for early July, but cancelled due to flood water.

H. Disease

A dead raccoon was brought to refuge headquarters during mid-December. This animal had been found dead in the barn on the Jake Kaye farm northeast of Sumner. The animal was later examined by Dr. Kintner, Veterinary Pathologist at the University of Missouri. The cause of death was determined to be acute feline enteritis. This was the first time this disease had been discovered in a raccoon in Missouri. The disease is probably transmitted from cats to raccoons, and may be rather common when raccoons are concentrated around farm buildings.

## III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

The main entrance road levee required considerable work after being damaged by the June flood. All the debris left by the flood had to be piled and burned. Over two days were spent with the D-7 and scraper filling washouts. Several days were spent with the motor grader and a tractor with blade pulling gravel back onto the road from the shoulder of the levee. After the repair work was completed the road was surfaced with a coating of coarse rock to be followed by a coating of fine rock.

Flood water deposited some debris on all fields. This all had to be picked up before farming operations could resume.

A cannon net trap site was put in on the northwest corner of Swan Lake. This required dozing out brush and trees, sloping the site, and putting in permanent cannon backstops. Work on the site was not completed, but it should be ready for use next year. During the winter geese almost always congregate in this sheltered spot during cold periods. It is an ideal spot for post-season trapping. This site should have been developed years ago.

The sewage lagoon for the headquarters area was rebuilt to conform to HEW specifications.

The highway department contractor completed the fencing in the construction area on Routes CC and E. These areas were posted with refuge signs.

B. Plantings

Cultivated Crops

A total of 852 acres of corn was grown on the refuge. The refuge staff took care of 650 acres. Permittees planted 202 acres but only harvested about 400 bushels. The geese harvested the remainder. Of the total acreage only about 150 acres produced hard corn with an average yield of 80 bushels per acre. The remainder was soft corn and yielded only an estimated 35 bushels per acre.

The refuge staff planted 350 acres of late milo. Adverse weather conditions and an early frost cut the yield to only about 15 bu/acre.

Permittees planted 164 acres of beans. These beans were planted late and before they were dry enough for the farmers to harvest, the geese had already completed the job.

Wheat was drilled for browse on 1,150 acres by State and Federal personnel. The State is credited with 600 acres leaving 550 acres planted by the refuge. In reality we helped prepare the ground and drill the wheat on about 50% of the acreage credited to the State. We did this partly to repay them for help provided in preparation of milo ground, but also to speed up their operation to get the wheat in

the ground in time for it to get some growth. We lost all our legumes to the flood and realized how important this wheat would be as an early food supply. However, dry weather prevailed and we were not successful in providing a good browse supply.

C. Collections and Receipts

This year all of our seed wheat was obtained from Clarence Cannon Refuge. This is an excellent source of supply and is much closer than having to haul it from DeSoto or even Squaw Creek.

Several loads of surplus corn and wheat were hauled from Squaw Creek for trap bait and feed.

D. Control of Vegetation

About 150 acres of corn was aerial sprayed with atrazine at a 4 lb/acre rate. The giant foxtail was thick and from 4 to 6 inches tall, but good results were obtained. Not all the foxtail was killed, but at least growth was retarded until we could get on the ground to cultivate.

Roads and levees were mowed to control woody vegetation and to allow them to blow free of snow in the winter.

E. Planned Burning

All burn areas were too wet to burn during planned periods.

F. Fires

No fires occured during the year. Fire danger was very low during the hunting season.

## V FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Pre-Season Teal Banding

We started trapping teal on August 22. There were no large concentrations of teal on the refuge this year. We were bothered by a high percentage of retakes of blue-wings in the wire traps. However, we were able to make several good net shots on green-wings, and were able to band 918 teal. Our quota was 1,000. We quit trapping teal on September 15, since the experimental season opened the following day.

Most of the cage trapping was done on Swan Lake near the White Barn and on the pond near sub-headquarters. All of the net trapping was done on the permanent site at the White Barn. Practically all of the blue-wings were taken in cage traps, and nearly all of the green-wings were taken with the cannon net.

Corn and wheat were used for bait with practically equal results.

The following table gives a breakdown of all ducks that were banded before the teal season.

| Species | Adult Male | Adult Female | Immature Male | Immature Female | Total |
|---|---|---|---|---|---|
| Green-winged Teal | 381 | 54 | 63 | 40 | 538 |
| Blue-winged Teal | 75 | 60 | 128 | 117 | 380 |
| Pintail | 24 | 17 | 3 | 12 | 56 |
| Wood Duck | 2 | 1 | 14 | 19 | 36 |
| | | | | Total ..... | 1,010 |

+ 918 pre-season
1,928

B. Canada Goose Banding

Our pre-season sample consisted of 2,000 regular bandings plus 250 neck banded experimentals. The neck bands were applied as a joint study with the Missouri Department of Conservation to try to determine local flock movements. No results have been summarized on this study. This sample consisted of 840 adult males, 643 adult females, 390 immature males, and 377 immature females. The immature to adult ratio was .517.

We caught an additional 1,050 Canadas before the season which were fluoroscoped and banded with bands assigned to the Missouri Department of Conservation, the fluoroscopy data has not yet been reported to us by the State. Both adults and immatures were fluoroscoped in approximately equal numbers. We also caught 326 banded birds pre-season. This gives a figure of 12.7% retakes for the total catch. The pre-season sample was trapped during the period of September 26 to October 18.

Our post season sample included 2,224 regular bandings and 250 neck banded birds. The sample consisted of 768 adult males, 720 adult females, 542 immature males, and 444 immature females. This gives an immature to adult ratio of .663.

Our post season fluoroscopy sample was 1,013 Canada geese.

We only banded nine small Canadas this fall. Three small Canadas wearing McInnes neck bands were observed on or near the refuge this fall. These birds were banded at the mouth of the McConnell River, N.W.T.

We banded a total of 6,797 Canada geese including those that were banded with the State's bands.

Our quota for regular bandings was 4,000.

C. Blue and Snow Goose Banding

We banded only 19 blues and snows this fall.

Several color ratio counts made this fall indicate that the birds using Swan Lake Refuge run around 58.5% blue geese.

We were able to observe only three snow geese wearing J. P. Prevett's neck bands this fall. These birds were banded near the mouth of the McConnell River, N.W.T.

D. Canada Goose Transplant

We still have a number of the previously transplanted birds showing up in our trap samples.

A recent memo from the Manager of Holla Bend NWR, Russellville, Arkansas reported that he had trapped four of the transplanted birds and two of our 1967 post season bandings on January 10, 1968.

## VI PUBLIC RELATIONS

A. Recreational Use

The recreational use of Swan Lake increased tremendously during 1967. Hunter numbers dropped as a result of the short goose season, but all other uses increased. Fishing more than doubled from 5,067 visits in 1966 to 14,600 in 1967. Miscellaneous use, which includes those who come to see, hear, and photograph geese, increased from 54,000 in 1966 to 72,310 visits in 1967. Actually the increase is not as significant as it would seem at first glance, for our recreational use during 1966 was less than in 1965.

Swan Lake was again designated as an entrance fee collection area under the LWCF Act of 1965. Fees were collected during the period that the main body of the refuge was open to the public, which runs from April 1 through September 10. The public accepted the program much better this year than in 1966. This acceptance is reflected in fee collections of only $906 in 1966 as compared to $2,418 in 1967. Yearly permits accounted for $2,056 of the total collections while only $362 were collected from daily permits. We try to promote the sale of yearly permits based on the convenience of not having to come to headquarters each day to buy the daily permit and the economy involved if they use this at any other fee area to any great extent. Actually most of our passport sales are to fishermen who use this area but never visit another fee area. Many of these people are retired and living on very limited incomes. We would like to have a "one area" season permit to sell for about three to four dollars. Reports from Washington sound like we might have it by 1969.

B. Refuge visitors are listed on the following pages.

| Name | Organization | Purpose of Visit | Date |
|---|---|---|---|
| Robert Tollerton | Linneus, Missouri | Canada Geese | 1/3/67 |
| Mrs Lee Fitchett & 5 Members | Chillicothe Bird Club | Bird Count | 1/7 |
| Mrs Lee Fitchett & 4 Members | Chillicothe Bird Club | Bird Count | 1/10 |
| Charles MacInnes | U. of Western Ontario | Banded Geese | 1/12 |
| Paul Prevett | U. of Western Ontario | Banded Geese | 1/12 |
| Wayne Sanders | Jefferson City, Mo. | Depredations | 1/23 |
| Jack Boyles | MCD Swan Lake | Shell Crackers | 2/6 |
| Gary Drown | Nebraska Consv. Dept. | Public Hunting | 2/7 |
| Wayne Sanders | FWS Jefferson City, Mo. | Dead Eagle | 2/8 |
| Harold Burgess | FWS Mound City, Mo. | Wildlife Society Meet | 2/9-10 |
| Wayne Peterson | Funks Hybrids | Goose Browse | 2/10 |
| Ron Anderson | Funks Hybrids | Goose Browse | 2/10 |
| Jack Frost | FWS St. Charles, Mo. | Shell Crackers | 2/13 |
| John Hague | FWS St. Joseph, Mo. | Depredations | 2/13 |
| Mr & Mrs Duffey | Ireland | Tour Area | 2/13 |
| Mr & Mrs Pryor | Marshall State School | Tour Area | 2/13 |
| Fack Freisner | MDC Ft. Grove | Brillion Mower | 2/24 |
| Larry Soloman | MDC Ft. Grove | Brillion Mower | 2/24 |
| Stan Cornelius | FWS Squaw Creek | See Area | 3/7 |
| Bob Ivins | FWS Sand Lake Refuge | M&E Seed | 3/9 |
| John Goddard | MDC Fisheries | Test Net Fish | 3/9 |
| Wayne Sanders | FWS Jefferson City | Depredations | 3/15 |
| Bill Knight | Chariton County Extension Agent | Youth Employment | 4/18 |
| Hollis Crawford w/42 pupils 7 adults | MDC Consv. Education New York School - Cameron, Mo. | Tour Refuge Tour Refuge | 4/18 4/18 |
| Robert Tollerton | Linneus, Mo. | New Road | 4/18 |
| Leo Kirsch | FWS Woodworth, N. D. | Visit | 4/19 |
| John Kiley | Hutchinson, Kansas | Visit | 4/19 |
| Dick Holler | Gaylord Lab | Rabbits | 4/25-26 |
| F.E. Matherly | Norfolk & Western R.R. | Ditch | 4/28 |
| Harris White | MDC Salisbury | Paddlefish Tag | 5/2 |
| Harry Rogers | Commercial Photography | Pictures | 5/9 |
| Bill Knight | County Extension Agent | Patricia Bates | 5/18 |
| Karl Slagle | MDC Columbia | Visit | 5/22 |
| Keith Thornsberry | Jamestown, N. D. | Visit | 5/26 |
| Doc Grey | N & W Railroad - Chillicothe | Flood Report | 6/1 |
| Harry Stiles | FWS - Minneapolis, Minn. | Inspection | 6/1-2 |
| Jim Monnie | FWS - Quincy, Ill. | Management | 6/5 |
| Coval Gann | MDC Chillicothe | Visit | 6/8 |
| Lynn Coy | Mo. State Highway Patrol | Visit | 6/12 |
| F.E. Matherly | Norfolk & Western R.R. | Flood Conditions | 6/15 |
| Melvin Rousch | Asst. County Agent | Patricia Bates | 6/21 |
| Jack Wallace | MDC Agent Supervisor | Introduce Bodenschatz | 6/21 |
| Allen W. Bodenschatz | MDC Conservation Agent | Meet Crew | 6/21 |
| Charles Guthrie | MDC Conservation Agent | Visit | 6/21 |

| Name | Organization | Purpose of Visit | Date |
|---|---|---|---|
| Lynn Coy | Mo. State Highway Patrol | Visit | 6/21 |
| Bill Otten | MCD Consv Agent | Meet Crew | 6/22 |
| Jack Wallace | MCD Agent Supervisor | Introduce Otten | 6/22 |
| Allen Bodenschatz | MCD Consv Agent | Enforcement | 6/26 |
| Reams Downey | Farming Permittee | 1967 Farming | 6/30 |
| Allen Bodenschatz | MCD Consv Agent | Enforcement | 7/6 |
| Wayne Sanders | FWS Jefferson City | Dove Trap Bait | 7/6 |
| Jan Hunt | 3M Company, Minneapolis | Visit | 7/10 |
| Fritz Kfege | FWS Sand Lake | Jamestown Steel | 7/17 |
| Jack Wallace | MDC Brookfield | Visit | 7/21 |
| Max A. Mull | Dept of Agriculture | See Area | 7/21 |
| Melvin Roweth | County Extension Agent | Worm Damaged Corn | 7/27 |
| Al Bodenschatz | MDC Brunswick | Law Enforcement | 8/3 |
| Larry Kline | El Paso, Illinois | Visit Area | 8/5 |
| Jack Wallace | MDC Brookfield | Fish Rescue | 8/7 |
| Larry Campbell | Flordia Fish & Game | Visit | 8/14 |
| Ed Larie | Ann Arbor, Michigan | BOR Recreation Insp. | 8/16 |
| Jim Monnie | FWS Quincy, Illinois | Banding Program | 8/6 |
| Jim Monnie | FWS Quincy, Illinois | Banding Program | 8/22-23 |
| Dick Vaught | MDC Columbia, Missouri | Fall Banding | 8/22-23 |
| Charley Guthrie | MDC Brookfield, Missouri | Pet Deer | 8/24 |
| Bill Otten | MDC Milan, Missouri | Pet Deer | 8/24 |
| Sammie C. Lewis | MDC Montrose Area | Visit | 8/24 |
| Bill Duncan | FBI Mexico, Missouri | Get Acquainted | 9/7 |
| George Brakhage | MDC Columbia, Missouri | Visit | 9/14 |
| Glenn Chambers | MDC Columbia, Missouri | Visit | 9/14 |
| Wayne Sanders | FWS Jefferson City | Teal Season | 9/15 |
| Paul Johnson | MDC Field Service Officer | Information | 9/21 |
| Sammie C. Lewis | MDC Montrose Area | Visit | 9/26 |
| Wayne Sanders | FWS Jefferson City | Leave Car | 9/27 |
| John Hague | FWS St. Joseph, Mo. | Pick Up Sanders | 9/27 |
| Wayne Sanders | FWS Jefferson City | Park House Trailer | 10/7 |
| Edwin H. Glaser | MDC Jefferson City | Buisness | 10/11 |
| D. O. Rettinger | MRBS Billings, Montana | Buisness | 10/11 |
| Gary Wood | MRBS Billings, Montana | Buisness | 10/11 |
| Harold Ensley | KCMO-TV Kansas City, Mo. | TV Pictures | 10/11 |
| Rainbo Garden Club | Richmond, Missouri | Tour Area | 10/13 |
| Mark Hall | KOMU-TV Columbia, Mo. | TV Pictures | 10/14 |
| Bill Horine | WDI-TV Ames, Iowa | TV Film & Radio Tapes | 10/14 |
| Nature Study Society | Webster Grove, Missouri | Tour, etc. | 10/14-15 |
| Dr. Wm. Elder and Students | University of Missouri | Assist with Banding and Tour Area | 10/14 |
| Mike Milonski | MDC Jefferson City | Tour Area | 10/15 |
| Charles Swartz | MDC Jefferson City | Tour Area | 10/15 |
| Jim Monnie | FWS Quincy, Illinois | Banding | 10/17-18 |
| Wayne Sanders | FWS Jefferson City | Hunting Season | 10/18-25 |
| Bill Horine | WDI TV Ames Iowa | Show TV Film | 10/20 |
| Bob Simpson | Bosworth, Missouri | Visit | 10/24 |
| Art Whitman | St. Louis Post Dispatch | Pictures | 10/25 |

| Name | Organization | Purpose of Visit | Date |
|---|---|---|---|
| Don Wooldridge | MDC Jefferson City | Pictures | 10/25 |
| Harold Terrill | MDC Columbia | Squirrel Damage Trees | 10/31 |
| Harlan Morgan | FWS Sikeston | Depredations | 11/3-14 |
| Wayne Sanders | FWS Jefferson City | Depredations | 11/3-14 |
| T. L. Berkley | Iowa Consv. Comm. | Inspection | 11/7 |
| John Beamer | Iowa Consv. Comm. | Inspection | 11/7 |
| Ralph Von Dane | FWS Peoria, Ill. | Goose Depredations | 11/12-13 |
| James C. Otis,Jr. | Bureau of Outdoor Recreation | Tour Area | 11/15 |
| John Hague | FWS St. Joseph | Depredations | 11/11-18 |
| Dick Basler | FWS St. Charles | Depredations | 11/24 |
| Doug Swanson | FWS Minneapolis, Minn. | Recon w/Osika | 11/30 |
| Ron Osika | RCMP Winnipeg, Manitoba | Recon w/M&E | 11/30 |
| Forrest Carpenter | FWS Minneapolis, Minn. | Inspection - Depred. | 12/5 |
| Harry Stiles | FWS Minneapolis, Minn. | Insp. & Depredations | 12/5 |
| Jim Monnie | FWS Quincy, Illinois | Wildlife Inventory | 12/8 |
| Max Hamilton | SCS Elsberry, Missouri | Goose Browse | 12/13 |
| Mr. Roundtree | SCS Elsberry, Missouri | Forage Plants | 12/13 |
| Jim Monnie | FWS Quincy, Illinois | Subspeciation C. Goose | 12/18-19 |

C. Refuge Participation

We had the refuge open on October 8 and again on October 15 for self guided tours. Both days turned out to be cold and rainy. However, we had a combined attendance of about 3,500 for the two days. Refuge personnel passed out literature and answered questions. Comments from the public were generally quite favorable, except in regard to the weather.

The following list includes programs and organized tours provided by refuge personnel.

| | | |
|---|---|---|
| 1/20 | Timmerman | Slide talk for 35 County Extension Club representatives at Sumner, Missouri. |
| 1/21 | " | Tour for 20 boy scouts and leaders from St. Louis, Mo. |
| 1/31 | " | Discussion with 70 Sportsman's Club members at Sumner, Mo. |
| 2/17 | " | Slide talk for 25 Extension Club members at Brunswick, Mo. |
| 2/28 | " | Talk, and movie on entrance fees for 90 persons at Sumner Sportsman's Club Meeting. |
| 3/11-12 | " | Orientation talk for 9 members, Cedar Falls, Iowa Audubon Club. |
| 4/3 | " | Slide talk for 25 Four H members at Sumner, Missouri. |
| 4/9 | " | Talk and tour for Dr. Wm. Elder and 25 ornithology students from University of Missouri, Columbia, Missouri |

| | | |
|---|---|---|
| 4/18 | Lentz | Talk and tour for 42 students and 7 adults from Hamilton, Missouri. |
| 5/2 | Timmerman | Discussion on park board and city park with Sumner City Council and Township Commissioners at Sumner. |
| 10/12 | " | Talk for 50 at Lion's Club meeting, Hale, Missouri. |
| 10/13 | " | Talk and tour for 15 members of garden club from Richmond, Missouri |
| 10/14 | " Kline | Goose trapping demonstration and participation for ten Explorer Scouts from North Kansas City, Missouri |
| 10/14 | Timmerman & Kline | Goose trapping demonstration, participation, and tour for Dr. Elder and 7 wildlife students from U of Mo. |
| 10/14 | Timmerman & Kline | TV film and radio tape for Bill Horine and camera crew from Ames, Iowa. |
| 10/14 | Timmerman | Talk and tour for 60 members of nature study group from Webster Groves, Missouri. |
| 10/14 | " | Tour for Dr. Luker and 7 students from Northeast Missouri State College - Kirksville, Missouri |
| 10/14 | Kline | TV film for Mark Hall and assistant from Channel 8 TV Columbia, Missouri. |
| 10/17 | Lentz | Talk and tour for 48 students and teachers from Marceline, Missouri Elementary School. |
| 11/11 | Timmerman | Tour for 50 from Hickman High School, Columbia, Mo. |
| 11/18 | " | Tour for Dr. Kucera and graduate students from University of Missouri at Columbia, Missouri. |

D. Hunting

The Canada goose season opened on October 20 and lasted 24 days through November 12. This was the shortest season ever held in this area. The shortest season previous to this year was in 1961 when Canada goose hunting lasted 25 days. The total estimated kill in the Swan Lake Zone was 27,943. This exceeded the maximum kill quota by almost 3,000.

The daily bag limit could include only one Canada goose for the first twelve days of the season. The bag limit was increased to two Canada geese on November 1 and remained two for the remainder of the season. Possession limit was four. This arrangement of opening with a one bird bag and going to a two bird bag on November 1 had been

agreed upon at a Federal-State meeting held on April 19. We pushed hard for opening with a one bird bag limit and were very happy when the State agreed to it. After they saw how well it was accepted by the hunters, I'm sure the State will open the season with a one bird bag limit next year with the understanding that if the Canada goose population is high and the kill low they will be allowed to increase to a two bird bag later in the season. This of course could only be done after mutual agreement was reached by Federal and State authorities.

Earlier in this report we explained food conditions on the refuge. All other factors being equal, when we have poor crop production on the refuge we can expect a high kill and a short season. This year was no exception. Although the opening day kill dropped to 2,059 this year from 4,022 in 1966, the kill remained high throughout the season. On only nine days the kill dropped below 1,000 and the zone kill was less than 600 only two days.

The one Canada goose limit had somewhat the effect of half-day shooting. Hunters on the area killed their limits early and most pits were empty by noon. A few hunters waited it out trying for blues and snows, but most of them quit when they had their Canadas. This allowed the geese to feed in the hunting zone and to fly out over the close areas on private land. When the hunters on close areas of private land filled out this allowed the geese to go on out further. Many farmers a considerable distance from the refuge reported that they had the best hunting ever. These are the fellows who usually suffer depredations but realize nothing from hunters or hunting. Even though the one bird bag may not have lowered the kill to too great an extent, it did spread the hunting out to more people over a larger area.

Before we get too far away from it perhaps we should explain why the kill was allowed to go to almost 28,000 when the quota was only 25,000. It came as no surprise as we had projected the kill to within a few hundred geese. It just takes this long to get the wheels in motion and everything arranged. We notified the regional office on the sixth and they in turn contacted Washington. Mr. Tunison signed the closing order at 3:30 P.M. on the eighth. This closure has to be published in local papers at least 48 hours prior to the closure. There was some question as to whether or not it could be gotten into all editions on Thursday the ninth. So just to be sure that enough time was allowed the closure was set for Sunday night November 12. The State also has the problem of contacting hunters who have reservations for dates following the closing date. By holding the closure until Sunday night, they could contact Monday reservationsholders by phone and all the later ones by mail. Actually a kill of 28,000 didn't hurt the Eastern Prairie Canada Goose population.

The ten-shell limit was in effect on the area again this year and seemed to be accepted quite well. You will note from the following table that fifty cases were prosecuted for exceeding the shell limit. We feel that this results from more time spent on spy blind activity

rather than an actual increase in violations. Most of the hunters would only take ten shells to the blind with them, but if they had not killed the limit when the shells were gone they would return to the car for more ammunition.

This was a wet fall and the farmers were not able to harvest crops early. When the season closed on November 12 most of the corn and beans were still unharvested. We were immediately met by farmers with depredation complaints and wanting scaring permits. Unfortunately the moon was full and the geese were feeding night and day. It took an all out effort to keep the geese out of some of the fields close to the refuge. However, the farmers that really tried were able to save all or most of their crops. Some made no effort to keep the geese out and others didn't realize that the depredations were taking place until too late. These individuals had their harvesting done for them. We spent considerable time and money on demonstration materials and showing the farmers how to use them. The Refuge staff, Game Management Agents, and State Game Section personnel worked together on the project. We have issued 36 scaring permits to date. Most of the harvest is now completed. What crops are still in the field will probably have to stay there until spring. Most of the farmers were very cooperative and willing to help themselves. Several farmers have purchased their own exploders so they will be ready when this type situation recurs.

The following tables were taken from the public hunting area report of operations.

## SWAN LAKE DAILY WATERFOWL SHOOTING RECORD - 1967

| Date | No. of Hunters | Canada Geese | Blue & Snow Geese | White-front Geese | Total | Cripples | Ave. kill per hunter |
|---|---|---|---|---|---|---|---|
| Oct. 20 | 197 | 191 | 9 | 0 | 200 | 14 | 1.01 |
| 21 | 199 | 176 | 10 | 0 | 186 | 20 | .93 |
| 22 | 206 | 184 | 4 | 0 | 188 | 11 | .91 |
| 23 | 174 | 158 | 6 | 0 | 164 | 14 | .94 |
| 24 | 186 | 183 | 2 | 0 | 185 | 26 | .99 |
| 25 | 166 | 163 | 4 | 0 | 167 | 8 | 1.01 |
| 26 | 183 | 161 | 8 | 1 | 170 | 19 | .93 |
| 27 | 169 | 162 | 14 | 0 | 176 | 20 | 1.04 |
| 28 | 188 | 160 | 10 | 0 | 170 | 13 | .90 |
| 29 | 206 | 190 | 18 | 1 Ross | 209 | 21 | 1.01 |
| 30 | 171 | 156 | 28 | 0 | 184 | 18 | 1.08 |
| 31 | 105 | 100 | 5 | 0 | 105 | 21 | 1.00 |
| Nov. 1 | 171 | 313 | 10 | 0 | 323 | 27 | 1.89 |
| 2 | 187 | 314 | 5 | 0 | 319 | 37 | 1.71 |
| 3 | 154 | 230 | 0 | 0 | 230 | 27 | 1.49 |
| 4 | 178 | 271 | 7 | 0 | 278 | 30 | 1.56 |
| 5 | 180 | 261 | 5 | 0 | 266 | 34 | 1.48 |
| 6 | 167 | 256 | 1 | 0 | 257 | 22 | 1.54 |
| 7 | 154 | 237 | 2 | 0 | 239 | 22 | 1.55 |
| 8 | 167 | 291 | 4 | 0 | 295 | 25 | 1.77 |
| 9 | 181 | 303 | 1 | 0 | 304 | 37 | 1.68 |
| 10 | 165 | 262 | 0 | 0 | 262 | 32 | 1.59 |
| 11 | 185 | 280 | 2 | 0 | 282 | 34 | 1.52 |
| 12 | 176 | 272 | 0 | 0 | 272 | 29 | 1.55 |
| 24 days | 4,215 | 5,274 | 155 | 1 WF<br>1 Ross | 5,431 | 561 | 1.29 |

| | |
|---|---|
| Swan Lake Canada Goose Kill | 5,274 |
| Fountain Grove Canada Goose Kill | 3,055 |
| Estimated Outside Canada Goose Kill | 19,614 |
| Total Canada Goose Kill in Zone | 27,943 |
| Harvest Quota for the 1967 Season | 25,000 |

## COMPARISON OF SHOOTING DATA SINCE 1955

| Year | Length of Season | Peak Population | No. of Hunters | Kill on Area | Outside Kill |
|---|---|---|---|---|---|
| 1955 | 53 days | 133,500 (10-26) | 10,137 | 8,836 | 3,727 |
| 1956 | 70 days | 55,000 (11-5) | 11,204 | 3,118 | 1,140 |
| 1957 | 70 days | 42,000 (11-4) | 10.360 | 3,680 | 1,074 |
| 1958 | 70 days | 59,500 (10-27) | 9,256 | 6,186 | 3,410 |
| 1959 | 70 days | 57,000 (10-16) | 11,014 | 5,254 | 2,425 |
| 1960 | 31 days | 86,850 (10-17) | 6,343 | 6,895 | 3,680 |
| 1961 | 25 days | 75,000 (10-16) | 3,483 | 3,356 | 3,116 |
| 1962 | 60 days | 118,200 (11-21) | 9,609 | 5,506 | 7,208 |
| 1963 | 70 days | 130,225 (10-21) | 9,954 | 5,890 | 10,244 |
| 1964 | 55 days | 121,450 (10-19) | 9,164 | 9,069 | 15,691 |
| 1965 | 70 days | 119,350 (11-8) | 10,313 | 4,624 | 12,255 |
| 1966 | 39 days | 138,000 (10-31) | 6,933 | 8,015 | 18,605 |
| 1967 | 24 days | 127,265 (11-12) | 4,216 | 5,274 | 22,669 |

## CANADA GEESE EXAMINED AT CHECK STATION - 1967

| Date | IM | IF | AM | AF | Total Immatures | Total Adults | Weekly Ratio I/A | Total Ratio I/A |
|---|---|---|---|---|---|---|---|---|
| Oct. 20 - Oct. 26 | 439 | 403 | 112 | 124 | 842 | 236 | 3.57 | 3.57 |
| Oct. 27 - Nov. 2 | 479 | 421 | 139 | 149 | 900 | 288 | 3.13 | 3.24 |
| Nov. 3 - Nov. 9 | 508 | 521 | 230 | 238 | 1029 | 468 | 2.20 | 2.79 |
| Nov. 10 - Nov. 12 | 180 | 152 | 79 | 63 | 332 | 142 | 2.34 | 2.74 |
| Season Totals | 1606 | 1497 | 560 | 574 | 3103 | 1134 | | 2.74 |

Total Canada Geese examined at check station was 4,237.

## V. VIOLATIONS

| Violation | No. of Cases | Total Fines | Cost |
|---|---|---|---|
| Over limit of 10 shells | 50 | 750.00 | 473.00 |
| Taking over limit of geese | 7 | 125.00 | 60.50 |
| Attempting to take over limit of geese | 5 | 75.00 | 49.50 |
| Changing Blinds | 4 | 65.00 | 38.50 |
| Shooting out of assigned blind | 5 | 75.00 | 55.00 |
| Unplugged Shotguns | 3 | 40.00 | 27.50 |
| Refuge Tresspass | 5 | 60.00 | 55.00 |
| Totals | 79 | $ 1,190.00 | $ 759.00 |

There were five other cases dismissed and eight cases are still pending.

## VI. Non-resident Hunters Using Swan Lake During 1967

| State | Individual Hunters | No. of days Hunted | No. of Geese |
|---|---|---|---|
| Illinois | 116 | 131 | 187 |
| Iowa | 106 | 150 | 193 |
| Kansas | 91 | 115 | 139 |
| Minnesota | 10 | 11 | 14 |
| Arkansas | 2 | 2 | 2 |
| South Dakota | 2 | 2 | 4 |
| Ohio | 2 | 2 | 4 |
| Colorado | 1 | 2 | 1 |
| California | 1 | 2 | 1 |
| Louisana | 1 | 1 | 1 |
| Nebraska | 1 | 1 | 1 |
| | 333 | 419 | 547 |

F. Safety

No lost time accidents occurred during 1967. This station has 990 accident free days through December 31, 1967.

Regular monthly safety meetings were held.

The refuge canoe was labeled in accordance with the memo from the Regional Safety Chairman.

## VIII OTHER ITEMS

A. Unusual Observations

A Ross' goose was checked into the Public Hunting Area Headquarters on October 29. This is only the second record for this species in the Swan Lake area.

B. Addition To Staff

A long awaited and badly needed Assistant Refuge Manager position was established for this refuge. This position was ably filled by Larry Kline on August 13, 1967. Mr. Kline had been engaged in farming in Illinois for the past five years. He spent about a year as Refuge Manager Trainee at Mingo Refuge before going into farming. He was employed by the Pure Food and Drug Administration as an inspector prior to going to Mingo. Larry has fit right in and adapted well to our entire operation. He has only been here six months but we would find it hard to get along without him.

Regardless of how good a job we think he has done, I don't think he's going to make it. A stranger just doesn't come into a community and take money away from the local boys in "the game" at the Sportsman Club Meetings, go deer hunting and kill the biggest buck in the county, plus being the only member of the refuge staff to get a deer. It wouldn't surprise me if he goes out and catches the biggest and most fish when that season opens. No, I just don't think he's going to make it.

C. Credits For Preparation

Mr. Lentz prepared the visitor list, typed and helped assemble the report. Mr. Kline made out most of the NR forms and wrote sections II A, B, C, D, E, F, H, V; VI C, E, F; VII A. Mr. Timmerman wrote and edited the remainder of the report.

D. Photographs

The few photographs appended were taken by members of the staff with personal cameras. The refuge camera always seems to be broken or we just don't have it along when opportunities present themselves. We promise to do better next year.

SIGNATURE PAGE

Submitted by:

(Signature)
Robert H. Timmerman

Refuge Manager
Title

Date: February 9, 1968

Approved, Regional Office:

Date: FEB 12 1968

(Signature)

Regional Refuge Supervisor

All refuge signs were taken down and refinished during the winter and early spring. We need to have all new signs made when time and funds permit. Operator General Howerton on the left. Biological Technician Hull on the right. (Personal - MFL)

Last summer, during a period when everyone was busy working in the field, a house wren decided that the shop drill press was a good place for a nest. When the nest was discovered the young had already hatched All of the young except one were fledged successfully. (Personal - MFL)


FISHING
APRIL 1 TO SEPT. 10
REFUGE REGULATIONS
AVAILABLE
AT TOWER OR OFFICE
NIGHT USE PROHIBITED


DO NOT USE

Channel catfish caught in Elk Creek below the Silver Lake levee on the fourth day of the season. The large fish on the left weighed slightly over ten pounds. Mr. Lentz is Postmaster in Sumner, identical twin to the Refuge Clerk. (Personal - MFL)

This partial albino raccoon was taken on the refuge during the nuisance animal removal program. The man holding the animal is "Houn-dawg" Daugherity of Sumner. (Personal - MFL)


M. G. LENTZ
Sumner, Mo.
G.W. 6000-F.
CHEVROLET APACHE

Wet conditions during June made it impossible to cultivate or ground spray what little corn remained following the flood. Note the unhealthy color of corn and the rank healthy growth of weeds. (Personal - MFL)

This is the same field as above following an aerial application of 4lb/acre Atrazine and one cultivation. (Personal - MFL)

Refuge Manager Kline with the buck that he killed in the Yellow Creek bottoms during the 1967 season. (Personal - LGK)

Mr. Kline with the antlers from the deer shown above. These antlers scored 166 5/8 by Boone and Crockett measurement standards. Antlers must score at least 160 to be entered in the Boone and Crockett Club official record book. (Personal - MFL)


FEB • 68

3-1750
Form NR-1
(Rev. March 1953)

# WATERFOWL

REFUGE Swan Lake MONTHS OF January TO May, 1967

| (1) Species | (2) Weeks of reporting period: 1/1 - 7 (1) | 1/8 - 14 (2) | 1/15 - 21 (3) | 1/22 - 28 (4) | 1/29-2/4 (5) | 2/5 - 11 (6) | 2/12 - 18 (7) | 2/19 - 25 (8) | 2/26-3/4 (9) | 3/5 - 11 (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Swans: | | | | | | | | | | |
| Whistling | | | | | | | | | | |
| Trumpeter | | | | | | | | | | |
| Geese: | | | | | | | | | | |
| Canada | 20,000 | 50,000 | 83,000 | 85,000 | 40,000 | 20,000 | 80,000 | 60,000 | 80,000 | 60,000 |
| Cackling | | | | | | | | | | |
| Brant | | | | | | | | | | |
| White-fronted | | | | | | | 20 | | 500 | 200 |
| Snow | | 200 | 1,000 | 1,000 | [illegible] | 100 | 100 | [illegible] | 5,000 | 5,000 |
| Blue | | | | | | | | | | |
| Other | | | | | | | | | | |
| Ducks: | | | | | | | | | | |
| Mallard | 100 | 500 | 1,500 | 1,000 | | 200 | 4,000 | 2,000 | 25,000 | 30,000 |
| Black | | | | | | | | | | |
| Gadwall | | | | | | | | | | |
| Baldpate | | | | | | | | | 200 | 200 |
| Pintail | | | | | | | 50 | 50 | 15,000 | 15,000 |
| Green-winged teal | | | | | | | | 20 | 4,000 | 8,000 |
| Blue-winged teal | | | | | | | | | | |
| Cinnamon teal | | | | | | | | | | |
| Shoveler | | | | | | | | | | 10 |
| Wood | | | | | | | | | | 20 |
| Redhead | | | | | | | | | | 10 |
| Ring-necked | | | | | | | | | 50 | 50 |
| Canvasback | | | | | | 10 | 10 | | 10 | 10 |
| Scaup | | | | | | | | | 20 | 100 |
| Goldeneye | | | | | | | | | | |
| Bufflehead | | | | | | | | | | |
| Ruddy | | | | | | | | | | |
| Other Common Merg. | | | 30 | | | 30 | 100 | | 100 | 50 |
| Hooded Merganser | | | | | | | | | | 10 |
| Coot | | | | | | | | | | 10 |

3 -1750a

Cont. NR-1
(Rev. March 1953)

# WATERFOWL
(Continuation Sheet)

REFUGE Swan Lake MONTHS OF January TO May, 1967

| (1) Species | (2) Weeks of reporting period: 3/12-18 (11) | 3/19-25 (12) | 3/26-4/1 (13) | 4/2-18 (14) | 4/19-15 (15) | 4/16-22 (16) | 4/23-29 (17) | (18) | (3) Estimated waterfowl days use | (4) Production: Broods seen | Estimated total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Swans:** | | | | | | | | | | | |
| Whistling | | | | | | | | | | | |
| Trumpeter | | | | | | | | | | | |
| **Geese:** | | | | | | | | | | | |
| Canada | 70,000 | 50,000 | 20,000 | 10,000 | 4,000 | 1,000 | 600 | | 5,191,200 | | |
| Cackling | | | | | | | | | | | |
| Brant | | | | | | | | | | | |
| White-fronted | 300 | 100 | 100 | 50 | | | | | 8,890 | | |
| Snow / Blue | 12,000 | 40,000 | 20,000 | 10,000 | 5,000 | 1,500 | 200 | | 707,700 | | |
| Other | | | | | | | | | | | |
| **Ducks:** | | | | | | | | | | | |
| Mallard | 60,000 | 15,000 | 2,000 | 100 | 50 | 20 | 20 | | 990,430 | | |
| Black | 100 | 100 | 50 | | | | | | 1,750 | | |
| Gadwall | 50 | 300 | 800 | 200 | 100 | 50 | 40 | | 10,780 | | |
| Baldpate | 400 | 600 | 1,200 | 300 | 200 | 10 | 10 | | 21,840 | | |
| Pintail | 8,000 | 4,000 | 400 | 20 | 50 | 10 | 10 | | 298,130 | | |
| Green-winged teal | 5,000 | 5,000 | 500 | 50 | | | | | 157,920 | | |
| Blue-winged teal | | 20 | 1,000 | 3,000 | 5,000 | 4,000 | 3,000 | | 112,140 | | |
| Cinnamon teal | | | | | | | | | | | |
| Shoveler | 3,000 | 7,000 | 4,000 | 3,000 | 3,000 | 2,000 | 1,500 | | 164,570 | | |
| Wood | 300 | 800 | 800 | 1,200 | 1,000 | 600 | 400 | | 35,840 | | |
| Redhead | 20 | 60 | 20 | 20 | 20 | 20 | 20 | | 1,330 | | |
| Ring-necked | 3,000 | 1,200 | 1,000 | 700 | 200 | 400 | 200 | | 47,010 | | |
| Canvasback | 20 | 40 | 40 | 10 | 20 | | 10 | | 1,330 | | |
| Scaup | 200 | 300 | 800 | 400 | 200 | 100 | 100 | | 15,540 | | |
| Goldeneye | | | | | | | | | | | |
| Bufflehead | 20 | 10 | 10 | 10 | 10 | | | | 420 | | |
| Ruddy | 10 | 50 | 80 | 50 | 100 | 20 | | | 2,170 | | |
| Other C. Merganser | 20 | 40 | 20 | 40 | | | | | 3,920 | | |
| Hooded Merganser | 10 | 10 | 10 | 20 | | | | | 420 | | |
| **Coot:** | 500 | 600 | 8,000 | 15,000 | 12,000 | 7,000 | 4,000 | | 329,770 | | |

(over)

| | (5) Total Days Use | (6) Peak Number | (7) Total Production |
|---|---|---|---|
| Swans | | | |
| Geese | 5,907,790 | 99,100 | |
| Ducks | 1,866,340 | 80,150 | |
| Coots | 389,770 | 15,000 | |

SUMMARY

Principal feeding areas: Remainder of chopped cornfields, wheat and lucine clover fields, lake margins.

Principal nesting areas: None

Reported by: Robert H. Timmerman

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

INT.-DUP., D.C.-53824-59

3-1750
Form NR-1
(Rev. March 1953)

# WATERFOWL

REFUGE Swan Lake MONTHS OF May TO August, 19 67

| (1) Species | (2) Weeks of reporting period: 4/30-5/6 (1) | 5/7-13 (2) | 5/14-20 (3) | 5/21-27 (4) | 5/28-6/3 (5) | 6/4-10 (6) | 6/11-17 (7) | 6/18-24 (8) | 6/25-7/1 (9) | 7/2 - 8 (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Swans:** | | | | | | | | | | |
| Whistling | | | | | | | | | | |
| Trumpeter | | | | | | | | | | |
| **Geese:** | | | | | | | | | | |
| Canada | 400 | 400 | 200 | 200 | 100 | 100 | 100 | 100 | 100 | 100 |
| Cackling | | | | | | | | | | |
| Brant | | | | | | | | | | |
| White-fronted | | | | | | | | | | |
| Snow / Blue | 100 | 100 | 50 | | | | | | | |
| Other | | | | | | | | | | |
| **Ducks:** | | | | | | | | | | |
| Mallard | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Black | | | | | | | | | | |
| Gadwall | 10 | 10 | 10 | 10 | | | | | | |
| Baldpate | | | | | | | | | | |
| Pintail | 10 | | | | | | | | | |
| Green-winged teal | | | | | | | | | | |
| Blue-winged teal | 3,000 | 2,000 | 1,200 | 500 | 100 | 30 | 30 | 30 | 30 | 30 |
| Cinnamon teal | | | | | | | | | | |
| Shoveler | 1,000 | 1,000 | 400 | 200 | 20 | | | | | |
| Wood | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| Redhead | | | | | | | | | | |
| Ring-necked | | | | | | | | | | |
| Canvasback | | | | | | | | | | |
| Scaup | 50 | | | | | | | | | |
| Goldeneye | | | | | | | | | | |
| Bufflehead | | | | | | | | | | |
| Ruddy | | | | | | | | | | |
| Other | | | | | | | | | | |
| **Coot:** | 2,000 | 2,000 | 1,000 | 800 | 200 | | | | | |

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Cont. NR-1
(Rev. March 1953)

# WATERFOWL
(Continuation Sheet)

REFUGE Swan Lake MONTHS OF May TO August, 19 67

| (1) Species | (2) Weeks of reporting period | | | | | | | | (3) Estimated waterfowl days use | (4) Production | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7/9-15 | 7/16-22 | 7/23-29 | 7/30-8/5 | 8/6-12 | 8/13-19 | 8/20-26 | 8/27-9/2 | | Broods seen | Estimated total |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | | | |
| Swans: | | | | | | | | | | | |
| Whistling | | | | | | | | | | | |
| Trumpeter | | | | | | | | | | | |
| Geese: | | | | | | | | | | | |
| Canada | 100 | 100 | 100 | 100 | 100 | 200 | 200 | 100 | 19,600 | | |
| Cackling | | | | | | | | | | | |
| Brant | | | | | | | | | | | |
| White-fronted | | | | | | | | | | | |
| Snow | | | | | | | | | 1,750 | | |
| Blue | | | | | | | | | | | |
| Other | | | | | | | | | | | |
| Ducks: | | | | | | | | | | | |
| Mallard | 20 | 20 | 20 | 20 | 20 | 50 | 200 | 200 | 5,250 | | |
| Black | | | | | | | | | | | |
| Gadwall | | | | | | | | 10 | 350 | | |
| Baldpate | | | | | | | | | | | |
| Pintail | | | | | | 20 | 200 | 300 | 3,710 | | |
| Green-winged teal | | | | | | | 20 | 600 | 4,360 | | |
| Blue-winged teal | 30 | 30 | 30 | 30 | 30 | 40 | 400 | 700 | 57,680 | | |
| Cinnamon teal | | | | | | | | | | | |
| Shoveler | | | | | | | | | 18,360 | | |
| Wood | 400 | 400 | 400 | 400 | 400 | 600 | 800 | 700 | 56,700 | | |
| Redhead | | | | | | | | | | | |
| Ring-necked | | | | | | | | | | | |
| Canvasback | | | | | | | | | | | |
| Scaup | | | | | | | | | 350 | | |
| Goldeneye | | | | | | | | | | | |
| Bufflehead | | | | | | | | | | | |
| Ruddy | | | | | | | | | | | |
| Other | | | | | | | | | | | |
| Coot: | | | | | | | | | 42,000 | | |

(over)

| | (5) Total Days Use | (6) Peak Number | (7) Total Production |
|---|---|---|---|
| Swans | | | |
| Geese | 21,350 | 500 | |
| Ducks | 116,720 | 4,490 | |
| Coots | 42,000 | 2,000 | |

SUMMARY

Principal feeding areas Mud flats, lake shore, farming fields.

Principal nesting areas

Reported by Robert H. Zimmerman

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

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# WATERFOWL

REFUGE Swan Lake NWR MONTHS OF September TO December, 1967

| (1) Species | (2) Weeks of reporting period | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | 9/3 - 9 | 9/10 -16 | 9/17-23 | 9/24 - 30 | 10/1 - 7 | 10/8 - 14 | 10/15 -21 | 10/22-28 | 10/29-11/4 | 11/5-11 |
| Swans: | | | | | | | | | | |
| Whistling | | | | | | | | | | |
| Trumpeter | | | | | | | | | | |
| Geese: | | | | | | | | | | |
| Canada | 200 | 200 | 10,000 | 26,000 | 50,000 | 72,500 | 110,000 | 130,000 | 121,000 | 125,500 |
| Cackling | | | | | | | | | | |
| Brant | | | | | | | | | | |
| White-fronted | | | | | 50 | 100 | 150 | 150 | 100 | 100 |
| Snow | | | 60 | 500 | 2,000 | 3,800 | 18,000 | 30,000 | 27,000 | 15,000 |
| Blue | | | | | | | | | | |
| Other | | | | | | | | | | |
| Ducks: | | | | | | | | | | |
| Mallard | 200 | 300 | 1,000 | 3,000 | 12,500 | 18,000 | 46,500 | 75,000 | 90,000 | 75,000 |
| Black | | | 50 | 100 | 100 | 150 | 200 | 750 | 800 | 900 |
| Gadwall | | | | 50 | 100 | 500 | 500 | 750 | 800 | 750 |
| Baldpate | 10 | 20 | 1,000 | 1,000 | 1,200 | 1,500 | 2,000 | 2,000 | 2,000 | 1,500 |
| Pintail | 500 | 1,500 | 5,000 | 5,000 | 5,000 | 7,500 | 10,000 | 10,000 | 10,000 | 10,000 |
| Green-winged teal | 800 | 1,000 | 800 | 600 | 700 | 2,000 | 10,000 | 10,000 | 7,500 | 5,000 |
| Blue-winged teal | 800 | 900 | 800 | 400 | 400 | 250 | 100 | | | |
| Cinnamon teal | | | | | | | | | | |
| Shoveler | | | 100 | 150 | 250 | 500 | 500 | 250 | 250 | 200 |
| Wood | 700 | 700 | 700 | 700 | 700 | 800 | 700 | 500 | 750 | 750 |
| Redhead | | | | | | | | | 250 | 125 |
| Ring-necked | | | | | | | | | 2,000 | 1,000 |
| Canvasback | | | | | | | | | 50 | 25 |
| Scaup | | | | | | | | 100 | 8,000 | 4,000 |
| Goldeneye | | | | | | | | | | |
| Bufflehead | | | | | | | | | 50 | 25 |
| Ruddy | | | | | | | | | 250 | 125 |
| Other | | | | | | | | | 50 | 25 |
| | | | | | | | | | 50 | 25 |
| Coot: | | | 300 | 3,000 | 9,000 | 12,000 | 15,000 | 8,000 | 8,000 | 4,000 |

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Cont. NR-1
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# WATERFOWL
(Continuation Sheet)

REFUGE Swan Lake N.W. MONTHS OF September TO December, 1967

| (1) Species | (2) Weeks of reporting period: 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | (3) Estimated waterfowl days use | (4) Production: Broods seen | Estimated total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Swans: | 11/18-18 | 11/19-25 | 11/26-12/2 | 12/3-9 | 12/10-16 | 12/17-23 | 12/24-30 | | | | |
| Whistling | | | | | | | | | | | |
| Trumpeter | | | | | | | | | | | |
| Geese: | | | | | | | | | | | |
| Canada | 118,000 | 112,000 | 110,000 | 110,000 | 100,000 | 96,000 | 95,000 | | 9,774,800 | | |
| Cackling | | | | | | | | | | | |
| Brant | | | | | | | | | | | |
| White-fronted | | | | | | | | | 4,550 | | |
| Snow | 20,900 | 25,000 | 25,000 | 20,000 | 16,000 | 12,000 | 10,000 | | 1,574,000 | | |
| Blue | | | | | | | | | | | |
| Other | | | | | | | | | | | |
| Ducks: | | | | | | | | | | | |
| Mallard | 75,000 | 60,000 | 70,000 | 50,000 | 30,000 | 15,000 | 8,000 | | 4,106,900 | | |
| Black | 900 | 750 | 600 | 300 | 200 | 100 | | | 41,300 | | |
| Gadwall | 500 | 400 | 850 | 100 | | | | | 32,900 | | |
| Baldpate | 1,000 | 750 | 500 | | | | | | 101,360 | | |
| Pintail | 5,000 | 5,000 | 5,000 | 1,000 | 500 | 100 | | | 567,700 | | |
| Green-winged teal | 5,000 | 5,000 | 5,000 | 2,000 | 1,000 | 500 | 400 | | 111,200 | | |
| Blue-winged teal | | | | | | | | | 25,550 | | |
| Cinnamon teal | | | | | | | | | | | |
| Shoveler | 150 | 150 | 100 | | | | | | 18,800 | | |
| Wood | 750 | 500 | 500 | 250 | 100 | | | | 63,000 | | |
| Redhead | 25 | | | | | | | | 2,000 | | |
| Ring-necked | 250 | 250 | 250 | 50 | 50 | 50 | | | 27,300 | | |
| Canvasback | 25 | 25 | 25 | 15 | 10 | 10 | | | 1,295 | | |
| Scaup | 500 | 500 | 400 | 50 | 50 | 50 | | | 95,550 | | |
| Goldeneye | | | | | | | | | | | |
| Bufflehead | 25 | 25 | 25 | 10 | 10 | | | | 1,190 | | |
| Ruddy | 50 | 50 | 50 | 50 | 50 | 50 | | | 4,725 | | |
| Other Co. Merganser | | | | | | | | | 525 | | |
| Hooded Merganser | 25 | 25 | 25 | 25 | 15 | 10 | | | 1,400 | | |
| Coot: | 2,900 | 1,000 | 500 | 100 | 100 | | | | 444,500 | | |

(over)

| | (5) Total Days Use | (6) Peak Number | (7) Total Production |
|---|---|---|---|
| Swans | | | |
| Geese | 11,353,370 | 160,150 | |
| Ducks | 5,772,395 | 123,600 | |
| Coots | 444,500 | 15,000 | |

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by Robert H. Timmerman

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

INT.-DUP., D.C.-53824-59

3-1751
Form NR-1A
(Nov. 1945)

# MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of January to April 1967

| (1) Species | (2) First Seen | | (3) Peak Numbers | | (4) Last Seen | | (5) Production | | | (6) Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Common Name | Number | Date | Number | Date | Number | Date | Number Colonies | Total # Nests | Total Young | Estimated Number |
| **I. Water and Marsh Birds:** | | | | | | | | | | |
| American Bittern | 1 | 4/10 | | | | | | | | |
| White Pelican | 30 | 3/29 | | | | | | | | |
| Great Blue Heron | 1 | 4/11 | | | | | | | | |
| Common Egret | 2 | 4/25 | | | | | | | | |
| Pied-Billed Grebe | 1 | 3/18 | | | | | | | | |
| Cattle Egret | 5 | 4/11 | (On the George Timmeyer farm near Fountain Grove, and one on the Loyd Fobber farm May 2) | | | | | | | |
| **II. Shorebirds, Gulls and Terns:** | | | | | | | | | | |
| Ring-billed Gull | 1 | 3/1 | | | | | | | | |
| Woodcock | 1 | 3/12 | | | | | | | | |
| Common Snipe | 1 | 4/9 | | | | | | | | |
| Upland Plover | 1 | 4/7 | | | | | | | | |
| Killdeer | 1 | 4/10 | | | | | | | | |
| American Avocet | 15 | 4/27 | | | | | | | | |

(over)

3-1751
Form NR-1A
(Nov. 1945)

# MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of January to April 1967

| (1) Species | (2) First Seen | | (3) Peak Numbers | | (4) Last Seen | | (5) Production | | | (6) Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Common Name | Number | Date | Number | Date | Number | Date | Number Colonies | Total # Nests | Total Young | Estimated Number |
| I. Water and Marsh Birds: | | | | | | | | | | |
| American Bittern | 1 | 4/10 | | | | | | | | |
| White Pelican | 30 | 3/29 | | | | | | | | |
| Great Blue Heron | 1 | 4/11 | | | | | | | | |
| Common Egret | 2 | 4/25 | | | | | | | | |
| Pied-Billed Grebe | 1 | 3/18 | | | | | | | | |
| Cattle Egret | 5 | 4/11 | (On the George Timmeyer farm near Fountain Grove, and one on the Loyd Potter farm May 2) | | | | | | | |
| II. Shorebirds, Gulls and Terns: | | | | | | | | | | |
| Ring-billed Gull | 1 | 3/1 | | | | | | | | |
| Woodcock | 1 | 3/12 | | | | | | | | |
| Common Snipe | 1 | 4/9 | | | | | | | | |
| Upland Plover | 1 | 4/7 | | | | | | | | |
| Killdeer | 1 | 4/10 | | | | | | | | |
| American Avocet | 15 | 4/27 | | | | | | | | |

(over)

3-1751
Form NR-1A
(Nov. 1945)

# MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of May to August 1967

| (1) Species | (2) First Seen | | (3) Peak Numbers | | (4) Last Seen | | (5) Production | | | (6) Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Common Name | Number | Date | Number | Date | Number | Date | Number Colonies | Total # Nests | Total Young | Estimated Number |
| I. Water and Marsh Birds: | | | | | | | | | | |
| Great Blue Heron | Summer | Resident | 100 | July | | | | | | |
| Green Heron | Summer | Resident | 10 | 8/31 | | | | | | |
| American Egret | Summer | Resident | 150 | July | | | | | | |
| White Pelican | 6 | 8/21 | 6 | 8/21 | | | | | | |
| American Bittern | Summer | Resident | 20 | 8/31 | | | | | | |
| II. Shorebirds, Gulls and Terns: | | | | | | | | | | |
| Killdeer | Summer | Resident | 300 | 8/31 | | | | | | |
| Upland Plover | Summer | Resident | 50 | July | | | | | | |
| Sora Rail | None were seen or heard this period. | | | | | | | | | |
| American Avocet | 1 | 8/31 | | | | | | | | |

(over)

| (1) | (2) | | (3) | | (4) | (5) | (6) |
|---|---|---|---|---|---|---|---|
| III. Doves and Pigeons: | | | | | | | |
| Mourning dove | Summer | Resident | 2,000 | 8/31 | | | |
| White-winged dove | | | | | | | |
| IV. Predaceous Birds: | | | | | | | |
| Golden eagle | | | | | | | |
| Duck hawk | | | | | | | |
| Horned owl | | | 100 | Resident | | | |
| Magpie | | | | | | | |
| Raven | | | | | | | |
| Crow | Summer | Resident | 150 | 8/31 | | | |
| Turkey Vulture | 2 | 8/21 | 3 | 8/31 | | | |

Reported by Robert H. Timmerman

## INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiforme
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

3-1751
Form NR-1A
(Nov. 1945)

# MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of September to December 1967

| (1) Species | (2) First Seen | | (3) Peak Numbers | | (4) Last Seen | | (5) Production | | | (6) Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Common Name | Number | Date | Number | Date | Number | Date | Number Colonies | Total # Nests | Total Young | Estimated Number |
| I. Water and Marsh Birds: | | | | | | | | | | |
| White Pelican | 6 | 8/21 | 1300 | 9/27 | 1 | 10/30 | | | | |
| Common Egret | | | 75 | 9/1 | | | | | | |
| Sora Rail | 1 | 9/20 | | | | | | | | |
| Pied-billed Grebe | 65 | 9/21 | | | | | | | | |
| Least Bittern | 1 | 9/1 | | | | | | | | |
| American Bittern | None Observed this period. | | | | | | | | | |
| Black-crowned Night Heron | 10 | 9/21 | | | | | | | | |
| Great Blue Heron | | | 100 | Sept | 2 | Wintering | | | | |
| D.C. Cormorant | 1 | 11-1 | | | | | | | | |
| II. Shorebirds, Gulls and Terns: | | | | | | | | | | |
| Dowitcher | | | 200 - 300 | Sept. | | | | | | |
| American Avocet | 1 | 8/31 | 3 | 9/16 | | | | | | |
| Semipalmated Plover | 2 | 9/11 | | | | | | | | |
| American Woodcock | 1 | 10/20 | | | | | | | | |
| Ring-billed Gull | 7 | 9/21 | | | 2 | 12/19 | | | | |
| Caspian Tern | 6 | 9/19 | | | | | | | | |
| Black Tern | Numerous through September | | | | | | | | | |
| No other unusual or uncommon species were observed. | | | | | | | | | | |

(over)

| (1) | (2) | | (3) | | (4) | (5) | (6) |
|---|---|---|---|---|---|---|---|
| III. Doves and Pigeons: | | | | | | | |
| Mourning dove<br>White-winged dove | Summer, and to some extent permanent resident | | | | Fall population down somewhat from recent years. | | |
| IV. Predaceous Birds: | | | | | | | |
| Golden eagle | 1 | 10/18 | 2 | | Several occasions | | |
| Duck hawk | | | | | | | |
| Horned owl | Common permanent resident. | | | | | | |
| ~~Magpie~~ Long Eared Owl | 1 | 11/22 | | | | | |
| Raven | | | | | | | |
| Crow | Common permanent resident. | | | | | | |
| Bald Eagle | 1 | 9/27 | 60 | Oct-Nov | Wintering | | |
| Cooper's Hawk | Seen occasionally during period. | | | | | | |
| Sharp-shinned Hawk | Seen occassionally during period. | | | | | | |
| Red-tailed Hawk | Abundant - entire period. | | | | | | |
| Marsh Hawk | Seen frequently during period. | | | | | | |
| Rough-legged Hawk | Seen frequently during period. | | | | | | |

Reported by Robert H. Timmerman

## INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiforme
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

Swan Lake WATERFOWL UTILIZATION OF REFUGE HABITAT



Refuge R. H. Timmerman For 12-mo Refuge Managing August 31, 19__

Reported by _____ Title _____

| (1) Area or Unit Designation | (2) Habitat Type | (2) Habitat Acreage | | (3) Use-days | (4) Breeding Population | (5) Production |
|---|---|---|---|---|---|---|
| I Swan Lake | Crops | 700 | Ducks | 2,300,000 | 0 | 0 |
| | Upland | 200 | Geese | 6,100,000 | 0 | 0 |
| | Marsh | 300 | Swans | 0 | 0 | 0 |
| | Water | 600 | Coots | 110,000 | 0 | 0 |
| | Total | 1,800 | Total | 8,510,000 | 0 | 0 |
| II Silver Lake | Crops | 670 | Ducks | 2,200,000 | 70 | 60 |
| | Upland | 1,000 | Geese | 4,300,000 | 0 | 0 |
| | Marsh | 530 | Swans | 0 | 0 | 0 |
| | Water | 1,800 | Coots | 313,000 | 0 | 0 |
| | Total | 4,000 | Total | 6,813,000 | | |
| III South Lake | Crops | 830 | Ducks | 4,000,000 | 70 | 50 |
| | Upland | 300 | Geese | 8,800,000 | 0 | 0 |
| | Marsh | 1,570 | Swans | 0 | 0 | 0 |
| | Water | 300 | Coots | 310,000 | 0 | 0 |
| | Total | 3,000 | Total | 12,510,000 | | |
| IV River Bottoms | Crops | 400 | Ducks | 492,690 | 110 | 90 |
| | Upland | 1,650 | Geese | 286,280 | 0 | 0 |
| | Marsh | 20 | Swans | 0 | 0 | 0 |
| | Water | 30 | Coots | 7,420 | 0 | 0 |
| | Total | 2,100 | Total | 786,390 | 110 | 90 |
| Totals | Crops | 2,600 | Ducks | 8,992,690 | 250 | 200 |
| | Upland | 3,150 | Geese | 18,886,280 | 0 | 0 |
| | Marsh | 2,420 | Swans | 0 | 0 | 0 |
| | Water | 2,730 | Coots | 770,420 | 0 | 0 |
| | Total | 10,900 | Total | 28,649,390 | 250 | 200 |
| | Crops | | Ducks | | | |
| | Upland | | Geese | | | |
| | Marsh | | Swans | | | |
| | Water | | Coots | | | |
| | Total | | Total | | | |
| | Crops | | Ducks | | | |
| | Upland | | Geese | | | |
| | Marsh | | Swans | | | |
| | Water | | Coots | | | |
| | Total | | Total | | | |

(over)

## INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

(5) **Production:** Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1750c
Form NR-1C
(Sept. 1960)

# WATERFOWL HUNTER KILL SURVEY

Refuge Swan Lake Year 196 7

| (1) Weeks of Hunting | (2) No. Hunters Checked | (3) Hunter Hours | (4) Waterfowl Species and Nos. of Each Bagged | (5)** Total Bagged | (6)* Crippling Loss | (7) Total Kill | (8) Est. No. of Hunters | (9) Est. Total Kill |
|---|---|---|---|---|---|---|---|---|
| 10/20 -26 | 1311 | | Canada Geese | 1216 | 112 | 1328 | All refuge hunters were checked. | |
| 10/27 -11/2 | 1197 | | " " | 1395 | 157 | 1552 | | |
| 11/3 - 9 | 1181 | | " " | 1849 | 197 | 2046 | | |
| 11/10 - 12 | 526 | | " " | 814 | 95 | 909 | | |
| TOTALS | 4215 | | " " | 5274 | 561 | 5835 | | |

*Crippling loss is based on hunter reports, so it is probably not reliable.

**In addition 155 blue and snow geese, 1 white-fronted goose and one Ross' goose were harvested on the area this year.

(over)

## INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

# UPLAND GAME BIRDS

Refuge Swan Lake Months of January to April, 1967

| (1) Species | (2) Density | (3) Young Produced | | | (4) Sex Ratio | (5) Removals | | | (6) Total | (7) Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Common Name | Cover types, total acreage of habitat | Acres Per Bird | Number broods observed | Estimated Total | Percentage | Hunting | For Re-stocking | For Research | Estimated number using Refuge | Pertinent information not specifically requested. List introductions here. |
| Bob White | | | | | | | | | 300 | |
| Pheasant | | | | | | | | | | None Observed |
| Pinnated Grouse | | | | | | | | | | None Observed |

# INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, phesants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

# UPLAND GAME BIRDS

Refuge Swan Lake Months of May to August, 1967

| (1) Species | (2) Density | | (3) Young Produced | | (4) Sex Ratio | (5) Removals | | | (6) Total | (7) Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Common Name | Cover types, total acreage of habitat | Acres per Bird | Number broods obs'v'd. | Estimated Total | Percentage | Hunting | For Re-stocking | For Research | Estimated number using Refuge | Pertinent information not specifically requested. List introductions here. |
| Bob White | | | | | | | | | 200 | June flood pushed all quail to high ground. |
| Pheasant | | | | | | | | | | Occasional sightings near the refuge. |

## INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

# UPLAND GAME BIRDS

Refuge Swan Lake Months of September to December, 19 67

| (1) Species | (2) Density | | (3) Young Produced | | (4) Sex Ratio | (5) Removals | | | (6) Total | (7) Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Common Name | Cover types, total acreage of habitat | Acres per Bird | Number broods obs'v'd. | Estimated Total | Percentage | Hunting | For Re-stocking | For Research | Estimated number using Refuge | Pertinent information not specifically requested. List introductions here. |
| Bob White | | | | | | | | | 300 | |
| Ring-necked Pheasant | | | | | | | | | | Several sightings during period. |
| Greater Prairie Chicken | | | | | | | | | | None observed. |

## INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Swan Lake Calendar Year 1967

| (1) Species | (2) Density | (3) Young Produced | (4) Removals | | | | (5) Losses | | | (6) Introductions | | (7) Estimated Total Refuge Population | | (8) Sex Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common Name | Cover types, total Acreage of Habitat | Number | Hunting | For Re-stocking | Sold | For Research | Predation | Disease | Winter Loss | Number | Source | At period of Greatest use | As of Dec. 31 | |
| White-tailed Deer | | | | | | | | | | | | 325 | 325 | |

Remarks: Population remains in good condition and increasing slightly.

Reported by _____

## INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

INT.-DUP. SEC., WASH., D.C. 59319

3-1754
Form NR-4
(June 1945)

# SMALL MAMMALS

Refuge Swan Lake Year ending April 30, 1967

| (1) Species | (2) Density | | (3) Removals | | | | | (4) Disposition of Furs | | | | | | (5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Share Trapping | | | | | | |
| Common Name | Cover Types & Total Acreage of Habitat | Acres Per Animal | Hunting | Fur Harvest | Predator Control * | For Re-stocking | For Re-search | Permit Number | Trappers' Share | Refuge share | Total Refuge Furs Shipped | Furs Donated | Furs Destroyed | Total Population |
| Raccoon | | | | 176 | 5 | | | | 176 | | | | 5 | 300 |
| Muskrat | | | | 22 | | | | | 22 | | | | | 400 |
| Coyote | | | | | | | | | | | | | | 5 |
| Beaver | | | | 5 | | | | | 5 | | | | | 100 |
| Red Fox | | | | 2 | | | | | 2 | | | | | 5 |
| Mink | | | | 4 | | | | | 4 | | | | | 30 |
| Fox Squirrel | | | | | | | | | | | | | | 2,000 |
| Grey Squirrel | | | | | | | | | | | | | | 1,000 |
| Cottontail | | | | | | | | | | | | | | 3,000 |
| Opossum | | | | 27 | | | | | 27 | | | | | 200 |
| Skunk | | | | | | | | | | | | | | 100 |
| Woodchuck | | | | | 4 | | | | | | | | 4 | 200 |
| Franklin's Ground Squirrel | | | | | | | | | | | | | | 50 |

* List removals by Predator Animal Hunter

REMARKS:

Reported by Robert H. Timmerman

# INSTRUCTIONS

Form NR-4 - **SMALL MAMMALS** (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) **SPECIES:** Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) **DENSITY:** Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) **REMOVALS:** Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) **DISPOSITION OF FUR:** On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) **TOTAL POPULATION:** Estimated total population of each species reported on as of April 30.

**REMARKS:** Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32715

3-1755
Form NR-5
60701

# DISEASE

Refuge Swan Lake Year 1967

## Botulism

Period of outbreak None

Period of heaviest losses

Losses:

| | Actual Count | Estimated |
|---|---|---|
| (a) Waterfowl | | |
| (b) Shorebirds | | |
| (c) Other | | |

| Number Hospitalized | No. Recovered | % Recovered |
|---|---|---|
| (a) Waterfowl | | |
| (b) Shorebirds | | |
| (c) Other | | |

Areas affected (location and approximate acreage)

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life

Remarks

## Lead Poisoning or other Disease

Kind of disease None

Species affected

| Number Affected Species | Actual Count | Estimated |
|---|---|---|
| | | |
| | | |
| | | |

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

NR-6

Bureau of Sport Fisheries and Wildlife

# PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge **Swan Lake** Calendar Year **1967**

1. Visits

a. Hunting **4,218** b. Fishing **14,600** c. Miscellaneous **72,310** d. TOTAL VISITS **91,128**

1a. Hunting (on refuge lands)

| TYPE | HUNTERS | ACRES | MANAGED BY |
|---|---|---|---|
| Waterfowl | 4,218 | 1,000 | State |
| Upland Game | | | |
| Big Game | | | |
| Other | | | |

Number of permanent blinds **60**

Man-days of bow hunting included above **-**

Estimated man-days of hunting on lands adjacent to refuge **25,000**

1b. Fishing (area open to fishing on refuge lands)

| TYPE OF AREA | ACRES | MILES |
|---|---|---|
| Ponds or Lakes | 3,000 | |
| Streams and Shores | | |

1c. Miscellaneous Visits

Recreation **53,600** Official **250**

Economic Use **150** Industrial

2. Refuge Participation (groups)

| TYPE OF ORGANIZATION | On Refuge NO. OF GROUPS | On Refuge NUMBER IN GROUPS | Off Refuge NO. OF GROUPS | Off Refuge NUMBER IN GROUPS |
|---|---|---|---|---|
| Sportsmen Clubs | | | 2 | 160 |
| Bird and Garden Clubs | 4 | 89 | | |
| Schools | 7 | 194 | | |
| Service Clubs | | | 4 | 125 |
| Youth Groups | 11 | 30 | 1 | 25 |
| Professional-Scientific | | | | |
| Religious Groups | | | | |
| State or Federal Govt. | | | | |
| Other | | | | |

3. Other Activities

| TYPE | NUMBER | TYPE | NUMBER |
|---|---|---|---|
| Press Releases | 1 | Radio Presentations | 1 |
| Newspapers (P.R.'s sent to) | 7 | Exhibits | |
| TV Presentations | 3 | Est. Exhibit Viewers | |

3-1756

(Rev. 4/63)

## INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercoastal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and weekend samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 24-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

3-1757
Form NR-7
(April 1946)

# PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Swan Lake Year 1967

| Species | Location of Area Planted | Rate of Seeding or Planting | Amount Planted (Acres or Yards of Shoreline) | Amount & Nature of Propagules | Date of Planting | Survival | Cause of Loss | Remarks |
|---|---|---|---|---|---|---|---|---|
| Ladino Clover | | 6 | 75 | | 3/16-17 | None | Flood | Good stand prior to June flood. |

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches.....
Food strips, food patches.....
Forest plantings.....

Interior—Duplicating Section, Washington, D. C.

24315

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Swan Lake County Chariton State Missouri

| Cultivated Crops Grown | Permittee's Share Harvested | | Government's Share or Return | | | | Total Acreage Planted | Green Manure, Cover and Water-fowl Browsing Crops Type and Kind | Total Acreage |
|---|---|---|---|---|---|---|---|---|---|
| | | | Harvested | | Unharvested | | | | |
| | Acres | Bu./Tons | Acres | Bu./Tons | Acres | Bu./Tons | | | |
| Corn | 202 | 400 | | | 650 | 30,000 | | Wheat | 1,250 |
| Soybeans | 164 | - | | | | 1,650 | | | |
| Milo | | | | | 350 | 5,250 | | | |
| TOTALS | 366 | 400 | | | 1,000 | 36,900 | | | |
| | | | | | | | | Fallow Ag. Land | |

No. of Permittees: Agricultural Operations 5 Haying Operations _____ Grazing Operations _____

| Hay - Improved (Specify Kind) | Tons Harvested | Acres | Cash Revenue | GRAZING | Number Animals | AUM'S | Cash Revenue | ACREAGE |
|---|---|---|---|---|---|---|---|---|
| | | | | 1. Cattle | | | | |
| | | | | 2. Other | | | | |
| | | | | 1. Total Refuge Acreage Under Cultivation | | | | 2,616 |
| Hay - Wild | | | | 2. Acreage Cultivated as Service Operation | | | | 1,550 |

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.DUP.,D.C.61-88950

3-1570
NR-88
(4/54)

# REFUGE GRAIN REPORT

Refuge Swan Lake Months of January through December, 1967

| (1) Variety* | (2) On Hand Beginning of Period | (3) Received During Period | (4) Total | (5) Grain Disposed of | | | | (6) On Hand End of Period | (7) Proposed or Suitable Use* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Transferred | Seeded | Fed | Total | | Seed | Feed | Surplus |
| Corn | 200 | 800 | 1,000 | | | 600 | 600 | 400 | | 400 | |
| Wheat | | 1,600 | 1,600 | | 1,300 | 200 | 1,500 | 100 | | 100 | |

(8) Indicate shipping or collection points

(9) Grain is stored at White Barn

(10) Remarks Seed wheat obtained from Clarence Cannon Refuge. Other grain from Squaw Creek.

*See instructions on back.

# REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

**Report all grain in bushels.** For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

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3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

# ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge

Proposal Number | Reporting Year

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

| Date(s) of Application | List of Target Pest(s) | Location of Area Treated | Total Acres Treated | Chemical(s) Used | Total Amount of Chemical Applied | Application Rate | Carrier and Rate | Method of Application |
|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 6/21 | Giant Foxtail (Setoria sp) | Corn near H.Q. | 150 | Atrazine | 600 | 4 Lb/Acre | Water 7 Gal/Acre | Aerial Spraying |
| 7/28-31 | Army Worms | Late corn near H.Q. | 120 | Sevin | 120 | 1 Lb/Acre | Water 10 Gal/Acre | Band spray |

10. Summary of results (continue on reverse side, if necessary)

The atrazine had been scheduled to be band sprayed from the ground. Wet conditions prevented ground application. The foxtail was tall and rank when it was finally sprayed from the air, but still resulted in about an 80% kill.

One pound of sevin in 10 gallons of water was used in a band spray over the row for control of armyworms. Even at this low rate we attained a 70-80% kill.

35500